

PROJECT NUMBER: 1812
PROJECT TITLE: New Expanded Tobacco
PROJECT LEADER: W. D. Winterson
PERIOD COVERED: May, 1990

I. NEW EXPANSION PROCESS DEVELOPMENT

- A. **Objective:** Develop tobacco expansion technology and associated processing for the production of expanded tobacco materials having the physical and subjective characteristics required to support future product needs.
- B. **Results:** Carbon dioxide gas impregnation studies continued. A test grid is being run over a range of impregnation temperatures and pressures to quantify the effects of these variables on gas pick up and retention. Temperature has a critical impact for a given pressure. Adequate pick up has been observed at pressures as low as 300 psig. A test was run at General Foods which demonstrated the twin screw extruder was not capable of holding adequate impregnation pressure in a CO₂ - tobacco contact zone. An initial test using SF₆ as an impregnant was run at low pressure with little expansion observed, it will be retested at a higher pressure.

Attempts to use the thermal treatment unit as a constant moisture thermal setting device were unsuccessful due to excessive steam condensation. An alternative bench top design using superheated steam on flowing tobacco was developed with Development Engineering. Discussions are continuing with high temperature, short residence time flash dryer manufacturers including Bepex, CE Raymond, and Jet-O-Drier to arrange and execute equipment trials. Tentative dates have been established in June and July for tests.

Objectives and plans are being developed to evaluate whole blend partial expansion, both using the present DIET process and through alternate processes. Work is proceeding on a program to model the tower and separator with CHAM, a process modeling firm.

- C. **Plans:** Continue gas phase impregnation studies, investigate the fundamental mechanisms of tobacco expansion and collapse, and pursue methods of continuous gas phase impregnation. Test thermal setting of tobacco while minimizing changes in tobacco moisture content. Evaluate alternate expansion techniques. Initiate program on partial expansion and on computer modeling of the tower and separator.

II. DIET PROCESS IMPROVEMENTS

- A. **Objective:** Develop improvements to the existing DIET process for use if expansion production capacity is increased prior to completion of the new process development effort.
- B. **Results:** The first round of testing was completed on the plexiglass model of the tower and separator at PEMM-CORP. Plug flow was achieved using a baffle in the tangential separator. A drop test was run to evaluate the effect of drop distance on breakage of frozen impregnated filler.
- C. **Plans:** Prepare plans and implement to develop design information for inclusion in the planned DIET line addition at Cabarrus.